AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings, of claims in the application.

Cancel Claim 27

1.   **(Currently Amended)** A computer readable storage medium comprising stored computer-program instructions ~~executable~~ executed by a processor for implementing:

a hosting application implementing a common language runtime (CLR), wherein the host application supplies threading, memory, or synchronization support used by the CLR;

wherein the host application exposes a runtime hosting interface to abstract, customize, and integrate process execution between the host application and the CLR;

~~a~~ the runtime hosting interface comprising a host abstraction interface (HAI), the HAI corresponding to execution environment abstraction(s) supported by ~~a~~ the host application, at least one specific interface or object corresponding to a specific HAI accessible by ~~a runtime~~ the CLR during execution of runtime managed code and responsive to an action or event associated with an identified HAI, the HAI providing an interface for the ~~runtime~~ CLR to configure host execution environment parameters or to notify the host application of a ~~runtime~~ CLR event;

the host application or the ~~runtime~~ CLR negotiating, which will perform certain functions;

the ~~runtime~~ CLR allocating memory via at least one specific interface or object implemented by the host application;

the ~~runtime~~ CLR notifying when a task has been moved to or from a runnable state; and

the ~~runtime~~ CLR obtaining additional information during process execution.

2.   (Cancelled).

3.   **(Currently Amended)** A computer-readable storage medium as recited in claim 1, wherein the one or more execution environment abstractions correspond to management services for memory, threads/tasks, I/O completion, synchronization, runtime entry/exit notification, security context, impersonation, runtime configuration, customized assembly loading, host protection, garbage collection (GC), debugging, or executable code service abstractions.

4.   **(Currently Amended)** A computer-readable storage medium as recited in claim 1, wherein the runtime hosting interface further comprises a runtime interface (RI) for use by the host application to configure operations of the ~~runtime~~ CLR, notify the ~~runtime~~ CLR of an event, or to obtain additional information during host application process execution.

5.   (Currently Amended) A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to identify host application implemented ones of the HAI or associated object(s) for subsequent calling responsive to an action or event associated with an identified one of the respective execution environment abstractions.

6.   (Currently Amended) A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to request the host application to perform a memory allocation.

7.   (Currently Amended) A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to communicate a low memory notification from an operating system (OS) to the host application, or inform the host application of consequences of failing a particular memory allocation via an HAI.

8.   (Currently Amended) A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to create a new thread/task via the HAI.

9.   (Currently Amended) A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to reuse or pool a runtime-implemented portion of a task via the HAI.

10. **(Currently Amended)** A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to notify the host application that a task cannot be moved to a different physical OS thread and cannot have execution of the task blocked for a specified window of time.

11. **(Currently Amended)** A computer-readable storage medium as recited in claim 1, wherein the HAI comprises:

an interface for the ~~runtime~~ CLR to indicate a callback to the host application, the callback for notifying the ~~runtime~~ CLR when a task has been moved to a runnable or non-runnable state; and

if the task has been moved to a non-runnable state, an interface to specify that the task is to be rescheduled as soon as possible by the host application.

12. **(Cancelled).**

13. **(Currently Amended)** A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to:

provide a callback to the host application for notifying the ~~runtime~~ CLR that a task has been moved to a different locale or a locale has changed for the task; or

notify the host application, that a task has been moved to a different locale or a locale has changed for the task.

14. (Currently Amended) A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to delay the host application abort of a task.

15. (Currently Amended) A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to modify an object identified by an interface of the HAI.

16. (Original) A computing device as recited in claim 15, wherein the object is a task priority.

17. (Currently Amended) A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to notify the host application that a task/thread is to leave the ~~runtime~~ CLR into unmanaged code.

18. (Currently Amended) A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to notify the host application that a task/thread is to reverse-leave the ~~runtime~~ CLR into unmanaged code.

19. (Currently Amended) A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to notify the host application that a task/thread is to enter the ~~runtime~~ CLR from unmanaged code.

20.   (Currently Amended) A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to notify the host application that a task/thread is to reverse-enter the ~~runtime~~ CLR from unmanaged code.

21.   (Currently Amended) A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to specify a maximum number of threads/tasks that will be available to service requests on one or more I/O completion ports.

22.   (Currently Amended) A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to binding a handle to an I/O completion port of the host application.

23.   (Currently Amended) A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to supply the host application with a runtime implemented callback, the runtime implemented callback for invoking by the host application when an asynchronous I/O operation completes.

24. (Currently Amended) A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to supply a runtime implemented callback to the host application, the runtime implemented callback to be invoked by the host application when an asynchronous I/O operation completes, the runtime implemented callback being used by the ~~runtime~~ CLR to provide custom state information to the host application.

25. (Currently Amended) A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to:

generate a task; and

specify one or more synchronization objects for the task to substantially ensure host application knowledge of a lock on the task, the one or more synchronization objects comprising a critical section, a manual or auto-reset event, a semaphore, a reader/writer lock, and/or a task monitor.

26. (Currently Amended) A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to notify the host application of one or more runtime interfaces allowing the host application to notify the runtime of events or to obtain additional information during host application process execution.

27. (Cancelled)

28.   (**Currently Amended**) A computing device for enhanced runtime hosting, the computing device comprising:

memory;

a processor coupled to the memory;

means for identifying, by a common language runtime (CLR) ~~runtime~~ one or more execution environment abstractions implemented by a host application, the host application for hosting the ~~runtime~~ CLR;

during execution of runtime managed code and responsive to an action or event associated with an identified one of the respective execution environment abstractions, means for the ~~runtime~~ CLR to interface with specific ones of the execution environment abstractions;

means for ~~the~~ a host abstraction interface (HAI) providing an interface for the ~~runtime~~ CLR to configure host execution environment parameters or to notify the host application of a runtime event;

means for the hosting application to implement the CLR, wherein the host application supplies threading, memory, or synchronization support used by the CLR;

wherein the host application exposes a runtime hosting interface to abstract, customize, and integrate process execution between the host application and the CLR;

means for the HAI providing a pointer interface for the runtime with a pointer to an object associated with the pointer interface, the object for calling by the ~~runtime~~ CLR responsive to a specified event or criteria;

means for the host application or the ~~runtime~~ CLR negotiating, which will perform certain functions;

means for the ~~runtime~~ CLR allocating memory via at least one specific interface or object implemented by the host application;

means for the ~~runtime~~ CLR notifying when a task has been moved to or from a runnable state;

means for the runtime obtaining additional information during process execution; and

~~means for the hosting application to implement a common language runtime (CLR), wherein the host application supplies threading, memory, or synchronization support used by the CLR;~~

~~wherein the host application exposes a runtime hosting interface to abstract, customize, and integrate process execution between the host application and the CLR;~~

wherein the execution environment abstractions correspond to memory management, threads/tasks, I/O completion, synchronization, runtime entry/exit notification, security context, impersonation, runtime configuration, executable service code abstractions, or garbage collection (GC).

29.   (Cancelled).

30.   (Original) A computing device as recited in claim 28, wherein the execution environment abstractions comprise means for interfacing with an object associated with the host application, the runtime interfacing with the object responsive to a specified event or criteria that occurs during host application execution.

31.   (Currently Amended) A computing device as recited in claim 28, wherein the execution environment abstractions comprise means for the host application to configure operations of the ~~runtime~~ CLR, notify the runtime of an event, or to obtain additional information during host application process execution.

32.   (Currently Amended) A computing device as recited in claim 28, wherein the execution environment abstractions further comprise means for the ~~runtime~~ CLR to request a memory allocation.

33.   (Currently Amended) A computing device as recited in claim 28, wherein the execution environment abstractions comprise means for the ~~runtime~~ CLR to:

communicate a low memory notification from the OS to the host application; or

inform the host application of consequences of failing a particular memory allocation.

34.   (Currently Amended) A computing device as recited in claim 28, wherein the execution environment abstractions comprise means for the ~~runtime~~ CLR to create a new thread/task.

35.   (Currently Amended) A computing device as recited in claim 28, wherein the execution environment abstractions comprise means for the ~~runtime~~ CLR to reuse or pool a runtime-implemented portion of a task.

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36.   (Currently Amended) A computing device as recited in claim 28, wherein the execution environment abstractions further comprise means for the ~~runtime~~ CLR to notify the host application that a task cannot be moved to a different physical OS thread and cannot have execution of the task blocked for a specified window of time.

37.   (Currently Amended) A computing device as recited in claim 28, wherein the execution environment abstractions further comprise means for the ~~runtime~~ CLR to:

identify a runtime interface for the host application to invoke when a task has been moved to a runnable or non-runnable state; and

if the task has been moved to a non-runnable state, specify that the task is to be rescheduled by the host application.

38.   (Cancelled).

39.   (Currently Amended) A computing device as recited in claim 28, wherein the execution environment abstractions further comprise means for the ~~runtime~~ CLR to:

provide a callback to the host application for notifying the ~~runtime~~ CLR that a task has been moved to a different locale or a locale has changed for the task; or

notifying, by the runtime via the at least one specific interface or object, the host application, that a task has been moved to a different locale or a locale has changed for the task.

40.   **(Currently Amended)** A computing device as recited in claim 28, wherein the execution environment abstractions further comprise means for the ~~runtime~~ CLR to delay host application abort of a task.

41.   **(Currently Amended)** A computing device as recited in claim 28, wherein the execution environment abstractions further comprise means for the ~~runtime~~ CLR to adjust priority of a task associated with the host application.

42.   **(Currently Amended)** A computing device as recited in claim 28, wherein the execution environment abstractions further comprise means for the ~~runtime~~ CLR to notify the host application that a task/thread is to leave the ~~runtime~~ CLR into unmanaged code.

43.   **(Currently Amended)** A computing device as recited in claim 28, wherein the execution environment abstractions further comprise means for the ~~runtime~~ CLR to notify the host application that a task/thread is to reverse-leave the ~~runtime~~ CLR into unmanaged code.

44.   **(Currently Amended)** A computing device as recited in claim 28, wherein the execution environment abstractions further comprise means for the ~~runtime~~ CLR to notify the host application that a task/thread is to enter the ~~runtime~~ CLR from unmanaged code.

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45. (Currently Amended) A computing device as recited in claim 28, wherein the execution environment abstractions further comprise means for the ~~runtime~~ CLR to notify the host application that a task/thread is to reverse-enter the ~~runtime~~ CLR from unmanaged code.

46. (Currently Amended) A computing device as recited in claim 28, wherein the execution environment abstractions further comprise means for the ~~runtime~~ CLR to indicate to the host application a maximum number of threads/tasks that will be available to service requests on one or more I/O completion ports.

47. (Currently Amended) A computing device as recited in claim 28, wherein the execution environment abstractions further comprise means for the ~~runtime~~ CLR to bind a handle to an I/O completion port of the host application.

48. (Currently Amended) A computing device as recited in claim 28, wherein the execution environment abstractions further comprise means for the ~~runtime~~ CLR to indicate a runtime implemented callback to the host application, the runtime implemented callback for calling by the host application when an asynchronous I/O operation completes.

49. (Currently Amended) A computing device as recited in claim 28, wherein the execution environment abstractions further comprise means for the ~~runtime~~CLR to supply a runtime implemented callback to the host application, the ~~runtime~~ CLR implemented callback for invoking by the host application when an asynchronous I/O operation completes, the ~~runtime~~CLR implemented callback giving the host application an opportunity to communicate custom state information to the ~~runtime~~CLR implemented callback.

50. (Currently Amended) A computing device as recited in claim 28, wherein the execution environment abstractions further comprise means for the ~~runtime~~CLR to:

generate a task; and

create one or more synchronization objects for the task to substantially ensure host application knowledge of a lock on the task, the one or more synchronization objects comprising a critical section, a manual and/or auto-reset event, a semaphore, a reader/writer lock, or a task monitor.

51. (Currently Amended) A computing device as recited in claim 28, wherein the execution environment abstractions further comprise means for the ~~runtime~~CLR to notify the host application of one or more runtime interfaces exposed by the ~~runtime~~CLR, the runtime interfaces for the host application to notify the runtime of an event or to obtain additional information during process execution.

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52.   (Currently Amended) A computer-readable medium as recited in claim 1, wherein an interface of the HAI provides the ~~runtime~~ CLR with a pointer to an object associated with the interface, the object for calling by the ~~runtime~~ CLR responsive to a specified event or criteria.

53.   (Currently Amended) A computer-readable storage medium as recited in claim 1, wherein the HAI comprises an interface for the ~~runtime~~ CLR to:

queue a thread/task to a host application implemented thread pool;

set a size of the host application implemented thread pool; or

query the host application implemented thread pool.

54.   (Currently Amended) A computing device as recited in claim 28, wherein the execution environment abstractions further comprise means for the ~~runtime~~ CLR to:

queue a thread/task to a host application implemented thread pool;

set a size of the host application implemented thread pool; or

query the host application implemented thread pool.

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